A new species and a new combination in *Acrotriche* (Ericaceae: Styphelioideae: Styphelieae), with keys to the Western Australian members of the genus and its closest relative *Lissanthe*

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Abstract

Hislop, M. A new species and a new combination in *Acrotriche* (Ericaceae: Styphelioideae: Styphelieae), with keys to the Western Australian members of the genus and its closest relative *Lissanthe*. *Nuytsia* 16(2): 285–297 (2007). Descriptions, illustrations and distribution maps are given for a new species, *Acrotriche lancifolia* Hislop and its closest relative *A. patula* R.Br. with which it has hitherto been confused. A lectotype is also selected for *A. patula*. A new combination, *A. parviflora* (Stschegl.) Hislop is made. The case is argued for the removal of *A. depressa* R.Br. from the West Australian plant census. Keys are provided at the generic level to separate *Acrotriche* R.Br. from *Lissanthe* R.Br. and at the species level for all Western Australian members of these two related genera.

Introduction

Acrotriche R.Br. is a small, Australian endemic genus first described by Robert Brown (1810). It comprises 17 species which are scattered across southern Australia and as far up the eastern seaboard as north Queensland. Six occur in Western Australia.

Brown originally recognised eight species in his new genus (although *A. ovalifolia* was later reduced to synonymy under *A. cordata*). De Candolle (1839), Mueller (1855), and Bentham (1869) contributed three more names (*A. affinis*, *A. prostrata*, and *A. fasciculiflora* respectively) during the nineteenth century, and two were added (*A. halmaturina* and *A. rigida*) as part of a full revision of the genus by Paterson (1960). Since then three more names have been published – *A. baileyana* and *A. plurilocularis* by Jackes & Powell (1980) and *A. leucocarpa* by Jobson & Whiffin (1990). Recently the anomalous, Western Australian species, *Leucopogon durus* Benth., was also transferred to *Acrotriche* (Quinn *et al.* 2005), as one of a series of taxonomic changes resulting from an extensive molecular and morphological analysis of the phylogeny of the *Cyathodes* clade (*sensu* Quinn *et al.* 2003).

The same studies (Quinn *et al.* 2003; Quinn *et al.* 2005) provide strong support for the monophyly of *Acrotriche* and indicate its closest relative to be *Lissanthe* R.Br. The remaining genera belonging to the *Cyathodes* clade, *Leptecophylla* Weiller, *Cyathodes* Labill.and the recently described *Agiortia* C.J. Quinn and *Acrothamnus* C.J. Quinn, are distributed in eastern Australia (especially Tasmania), New Zealand, New Guinea and the islands of the Pacific.

This paper presents a taxonomic update of the genus *Acrotriche* in Western Australia which includes the recognition of a new species, *A. lancifolia* Hislop, the transfer of *Trochocarpa parviflora* Stschegl. to *Acrotriche*, and discussion of the doubtful status of *A. depressa* R.Br. as a Western Australian species. Updated keys to the Western Australian members of *Acrotriche* and *Lissanthe* are also provided.

Notes on morphology

Several morphological features combine to make *Acrotriche* one of the more distinctive genera within the tribe *Styphelieae*. With the single exception of *A. dura*, a unique corolla hair distribution is definitive for the genus. Hairs are grouped in two distinct regions of the corolla – on the lobes as subapical tufts, and in the distal portion of the tube, either directly from an unmodified epidermis, or from 5 raised, cushion-like outgrowths in the throat. Also characteristic of the genus are the inconspicuous, usually greenish flowers arranged in multiflowered, relatively dense inflorescences which are either axillary or issue from bare nodes below the leaves. Three further significant floral attributes are: a style that is always included within the tube, usually fully exserted anthers, and straight (rather than distinctly twisted or crinkled) corolla hairs.

As noted above, the recent recognition of *Acrotriche dura* (Benth.)Quinn has significantly modified the long established morphological circumscription of the genus. This species is anomalous primarily in having a white corolla with hairs thinly and evenly distributed across the lobes and into the distal portion of the inner tube. Additionally it has anthers partially enclosed within the tube at anthesis rather than fully exserted and often held at right angle to the floral axis, which is the usual configuration for the genus. Although the distribution of the corolla hairs is certainly aberrant in *A. dura*, the species does share a modified indumentum character with the other Western Australian members of the genus. Between the rather sparsely distributed longer hairs of the corolla lobes are numerous papillae which presumably represent vestigial hairs. The same papillae are also present below the subapical corolla tufts of typical members of the genus.

Methods

Plant growth habit and proportions have been taken from collector's notes together with personal observations. Foliar measurements were taken from dried specimens. Leaf thickness was measured at the midrib, half way up the lamina. Observations of the leaf venation were made from mature leaves only. Across the Tribe *Styphelieae* it is common for the young leaves to show prominently raised venation on the abaxial surface which is often much less evident, if at all, at maturity. Similarly the first leaves produced at the beginning of a flush of vegetative growth should be ignored. The lowest of these are usually manifestly atypical and bract-like, undergoing morphological transition through successive nodes until they reach the form of the mature leaves.

Inflorescence length is measured from the insertion point of the lowest basal bract to the tip of the bud rudiment. Floral measurements were taken from re-hydrated flowers (at least six per specimen and from different inflorescences, assuming material is sufficient) in natural posture.

The distribution map was compiled using Diva version 5.2.0.2 and based on PERTH specimen data.

Keys, descriptions and lectotypification

Key to the Western Australian genera in the *Cyathodes* group (*sensu* Quinn *et al.* 2005)

1. Leaves slightly concave, flat or slightly convex, or if margins manifestly recurved then abaxial surface clearly visible. Inflorescence axillary or issuing from bare nodes below the leaves. Corolla predominantly greenish with hairs largely restricted to subapical tufts on the lobes* and in the distal portion of the tube (except *A. dura* which has white flowers with corolla hairs evenly distributed across the lobes and into the throat). Flowers never pedicellate above the bracteoles ..... **Acrotriche**
1. Leaves with revolute margins abutting the midvein and completely obscuring the abaxial surface. Inflorescence terminal, and sometimes also upper axillary. Corolla white, red or purple, hair distribution not as above. Flowers often pedicellate above the bracteoles (western species only) ..... **Lissanthe**

Key to the Western Australian species of *Lissanthe*

1. Inflorescence pendulous. Corolla purple throughout or occasionally greenish in basal half, lobes very short < 0.5 mm long, remaining closed over the tube at anthesis. Anthers cohering around the stigma. (Wellstead to Bremer Bay) ..... **L. synandra**
1. Inflorescence erect. Corolla white or red, lobes > 1.8 mm long, spreading or recurved at anthesis. Anthers free from the stigma.
   2. Leaves obtuse. Corolla white. Flowers not or barely pedicellate above bracteoles. Ovary 1-locular. (Mostly coastal or subcoastal between Fitzgerald River National Park and Cape Arid National Park) ..... **L. pleurandroides**
   2. Leaves acute with ± pungent mucros. Corolla white or red. Flowers clearly pedicellate above bracteoles. Ovary 3–7 locular.
      3. Corolla red, tube > 3 mm long. (Central southern districts between Ongerup and Israelite Bay and as far north as Kumarl, north of Salmon Gums) ..... **L.rubicunda**
      3. Corolla white, tube < 3 mm long.
         4. Style hairy, well exserted from corolla tube. Ovary glabrous. (Northern sand-plains between Coomallo and the Mount Adams area) ..... **L. powelliae**
         4. Style glabrous, stigma held at the throat of the corolla tube. Ovary hairy. (Central south west districts between the Bullfinch- Southern Cross area and Jaurdi station north of Boorabbin) ..... **L. scabra**

* a very few hairs may be present below the subapical tuft.

Key to the Western Australian species of *Acrotriche*

1. Corolla white, hairs evenly distributed across the lobes and into the distal portion of the inner tube. (Borden–Wellstead–Ongerup area) ..... **A. dura**
1. Corolla predominantly greenish, occasionally yellowish green or greenish suffused purple, hairs largely restricted to subapical tufts on the lobes* and in the distal portion of the inner tube
2. Leaf apex long-mucronate, sharply pungent
3. Leaves with recurved margins. Sepals *c.* 2 mm long. Corolla lobes 2 mm long or more (Stirling Range to the Ravensthorpe area and between Cape le Grand National Park and Israelite Bay)..... **A. ramiflora**
3. Leaves slightly concave, flat or slightly convex. Sepals to 1.7 mm long. Corolla lobes to 1.3 mm long
4. Leaves ovate, occasionally narrowly ovate, 3–6 mm wide, most or at least some with cordate bases, veins 5–7(–9+), ± equally distinct, midrib to 0.1 mm wide. Corolla throat hairs issuing directly from unmodified epidermal cells. Endocarp with prominent longitudinal ribs (Coastal and subcoastal areas of the SE between Toolina Cove and the South Australian border)..... **A. patula**
4. Leaves narrowly ovate, 1.7–3.2 mm wide, base rounded but never cordate, veins 3–5 (usually 3) with the midrib prominent and usually produced into a distal abaxial keel, midrib 0.2–0.3 mm wide. Corolla throat hairs issuing from 5 raised, cushion-like outgrowths. Endocarp smooth (Central parts of the South West, between the Kondinin area in the west and the Bremer Range in the east, and between Great Eastern Highway in the north and the Lake King area) ..... **A. lancifolia**
2. Leaf apex usually obtuse or subacute, very occasionally acute but then with an innocuous callus tip.
5. Subapical hair tuft arranged in a crescent-shaped formation. Ovary 7–10-locular. Drupe ± dry, endocarp with prominent longitudinal ribs (Stirling Range to Ravensthorpe area with an outlier W of Lake Grace)..... **A. parviflora**
5. Subapical hair tuft a ± straight transverse band. Ovary 4–5-locular. Drupe with significant fleshy mesocarp, endocarp ± smooth (Mostly coastal between the central west coast near Leeman southwards along the west and south coasts to the South Australian border)..... **A. cordata**

* a very few hairs may be present below the subapical tuft.

Acrotriche patula R.Br. *Prod. Fl. Nov. Holl.* 547(1810).– *Styphelia patula* (R. Br.) Spreng., Syst. Veg. 1: 657(1824).

Type: Petrel Bay, Isle St. Francis, South Australia, 4 Feb. 1802, *R. Brown s.n.* (*lecto*: BM 000630019, here designated; *isolecto*: BM 000630018, scanned images seen).

Erect, divaricately branched *shrubs* usually to *c.* 60 cm high (rarely higher) and 60 cm across. Young *branchlets* medium to dark brown, with a moderate or dense indumentum of variably retrorse or patent hairs to 0.2 mm long; bark on older wood pale grey over brown, prominently fissured, retaining indumentum for several seasons but at length glabrescent. *Leaves* spirally arranged, widely spreading,

from shallowly antrorse to shallowly retrorse, ovate or narrowly ovate, 8–16 mm long, 3–6 mm wide; apex a sharply pungent mucro to 1.1 mm long; base rounded or cordate; petiole well defined, pale yellowish green to pale brown, 0.7–1.3 mm long, hairy on the adaxial surface or throughout with an indumentum of short patent hairs; lamina 0.3–0.5 mm thick, slightly recurved along the longitudinal axis, usually slightly concave, less often flat or slightly convex; surfaces markedly discolorous, adaxial surface shiny, often with indistinct transverse wrinkles, glabrous or with a sparse short indumentum towards the base, venation not evident, abaxial surface paler, glabrous, with 5–7 or more ± equally distinct, closely spaced veins and significant secondary vein development, the midrib not or barely more prominent than the rest (to 0.1 mm wide), shallowly grooved between the veins; the margins ciliolate with very short, stiff cilia throughout or restricted to the distal half. *Inflorescence* axillary or issuing from bare nodes below the leaves, widely spreading or pendulous; the axis 3–5 mm long, with 5–10 flowers, terminating in a bud-like rudiment or a blunt point, the base ± obscured by imbricate sterile bracts; indumentum of dense straight or curved, mostly patent hairs to 0.2 mm long. *Flowers* green or yellow green, erect or spreading and sessile. *Fertile bracts* shallowly triangular to depressed-ovate, 0.7–0.9 mm long, 1–1.2 mm wide, glabrous on both surfaces except for a zone of short hairs close to the base on the abaxial surface and sometimes also along the median line, obtuse; venation obscure; margins ciliolate. *Bracteoles* ovate to almost circular, 1.1–1.5 mm long, 1–1.2 mm wide, keeled; abaxial surface sparsely hairy along the keel, sometimes only in the basal half, glabrous elsewhere; margins ciliolate. *Sepals* ovate, 1.5–1.7 mm long, 1.2–1.3 mm wide, obtuse, both surfaces glabrous, abaxial surface with inconspicuous venation, pale green or greenish cream, margins ciliolate. *Corolla tube* cylindrical, much longer than the sepals (by up to 3 mm), 2.2–4.2 mm long, 0.8–1.5 mm wide, the outer surface glabrous, the inner with 5 hair tufts in the throat issuing from unmodified epidermal cells (the hairs 0.5–0.8 mm long), glabrous below the tufts; *lobes* widely spreading 1–1.3 mm long, 0.7–0.9 mm wide at base, glabrous externally, the inner surface with prominent, subapical tufts (the hairs 0.6–0.9 mm long), and usually with a few hairs below the tufts often on the median line, the rest of the surface papillose; corolla lobes much shorter than the tube (ratio = 0.26–0.48:1). *Anthers* fully exserted at anthesis and usually held at right angles to the floral axis, 0.5–0.8 mm long; *filaments* terete, attached just below the anther apex, 0.2–0.4 mm long, adnate to tube just below the sinus. *Ovary* broadly ellipsoid or globose, 0.6–0.9 mm long, 0.6–0.8 mm wide, glabrous, 5–7-locular; *style* 0.5–0.8 mm long, tapering smoothly from the ovary apex, included within the corolla tube; *stigma* not or scarcely expanded; *nectary* annular 0.4–0.5 mm long, entire or with an undulate or slightly jagged rim, glabrous. *Fruit* depressed obovoid, 3.2–3.5 mm long, 3.4–4.2 mm wide, much longer than calyx, mesocarp fleshy, manifesting as a sharply raised reticulum of transverse and longitudinal ridges on dried specimens, endocarp with prominent longitudinal ribs, style persistent. (Figure 1 A–E)

Other specimens examined. WESTERN AUSTRALIA: Nullarbor Plain, *c.* 1 km N of Eucla, N side of Eyre Highway, 30 Aug. 1974, *A.C. Beauglehole* 49453 (NSW, PERTH); Hampton escarpment, near E boundary of Eucla town site, at Telecom fibre optics placement, 9 June 1995, *G.F. Craig* 3156 (PERTH); Hampton escarpment, track along base of scarp between Eyre Bird Sanctuary Rd and Madura, 10 June 1995, *G.F. Craig* 3171 (PERTH); 5.4 km E of Twilight Cove, 4 June 2000, *R. Davis* 9206 (PERTH); 4.1 km W of Toolinna, 4 May 2004, *R. Davis* 10672 (NSW, PERTH); Twilight Cove, Great Australian Bight, 11 July 1974, *A.S. George* 11869 (PERTH); 5.6 km ENE of Toolinna Rockhole, SW of Caiguna, 16 Oct. 1985, *G.J. Keighery & J.J. Alford* 1007 (CANB, PERTH); Norina Rockhole, Hampton Scarp, 7 Aug. 2004, *W.P. Muir* 336 (PERTH); Hampton escarpment, 115 miles W of Eucla, 5 Sep. 1963, *J.H. Willis s.n.* (PERTH); Near Point Dover, *c.* 380 km W of S.A.-W.A. border, edge of Great Australian Bight, 19 July 1967, *P.G. Wilson* 5908 (CANB, NSW, PERTH); Near Point Dover, half a mile from cliff edge, 20 July 1967, *P.G. Wilson* 5955 (CANB, PERTH). SOUTH AUSTRALIA: American River, Kangaroo Island, 18 Aug. 1958, *B.R. Paterson s.n.* (AD, HO, MEL, NSW, PERTH); 14 km E of S.A.-W.A. border, lookout point to Eucla, 2 Aug. 1979, *J.M. Powell* 1117 (K, L, NSW, PERTH).

Distribution and habitat. *A. patula* has a coastal or subcoastal distribution in the south-east of Western Australia between the Toolinna Cove area and the South Australian border. It is apparently restricted to areas of shallow soil over limestone and is a component of heathland communities. The species is more widely distributed in South Australia where according to Powell *et al.* (1986) it grows over ironstone as well as on coastal limestone. (Figure 2)

Conservation status. In Western Australia the species occurs in remote and sparsely populated areas where there appear to be no short term threats to its survival. Several known populations are conserved in Nuytsland Nature Reserve. Several collectors however do make note of the significant local impact of rabbit grazing on this species. A return to high rabbit numbers on the Nullarbor may jeopardize its long term future in this area.

Typification. The selection of BM 000630019 as lectotype follows the intention of J.M. Powell who annotated the specimen to that effect on 19 Oct. 1993 but did not publish the lectotypification before her retirement.

Notes. The fire response of this species does not appear to have been recorded but most western species including *A. lancifolia* are known to have lignotuberous, fire tolerant rootstocks. Although the absence in *A. patula*, of the cushion like outgrowths in the corolla throat, is generally a reliable character separating that species from *A. lancifolia*, one collection (*R. Davis* 9206) provides an interesting exception. In this case while the flowers do have clearly demarcated outgrowths in the throat, they are in the form of transverse ridges, rather than the elliptic shape characteristic of *A. lancifolia*. In all other respects the specimen is typical for the species.

Acrotriche lancifolia Hislop, *sp. nov.*

A patulae affinis sed folii venis paucioribus latioribus, tumoribus pulviformibus in fauce ornatis, et endocarpo laevi differt.

Typus: Parker Range *c.* 800 m due S of tank, Western Australia, 2 August 2003, *M. Hislop & F. Hort* MH 2983 (*holo*: PERTH 06756670; *iso*: CANB, NSW).

Erect, divaricately branched, lignotuberous *shrubs* to *c.* 150 cm high and 150 cm across. Young *branchlets* light to medium brown, glabrous or with a sparse, irregular indumentum of patent, straight hairs to 0.05 mm long, usually early glabrescent; bark on older wood pale grey over darker greyish brown, usually prominently fissured with the outer layer flaking. *Leaves* spirally arranged, rather variably orientated, from moderately antrorse to moderately retrorse on the same branchlet, narrowly ovate or less often narrowly elliptic, 6–13 mm long, 1.7–3.2 mm wide; apex a sharply pungent mucro to 1.6 mm long; base rounded; petiole well defined, pale yellowish green to pale brown, 1–1.6 mm long, with an irregular indumentum of short hairs on the adaxial surface; lamina 0.5–0.7 mm thick, straight or gently incurved along the longitudinal axis, usually slightly convex, less often flat or slightly concave; surfaces discolorous, adaxial surface either pruinose and matt, or shiny through surface abrasion, glabrous or with a very sparse, short indumentum towards the base, venation not evident, abaxial surface paler, glabrous, smooth, with 3 or less often 5 prominent, primary veins and limited secondary development from the 2 laterals, the midrib usually rather more prominent than the others (0.2–0.3 mm wide) and often produced into a distinct keel in the distal third; the margins usually glabrous or occasionally with very short and sparse distal cilia. *Inflorescence* axillary or issuing

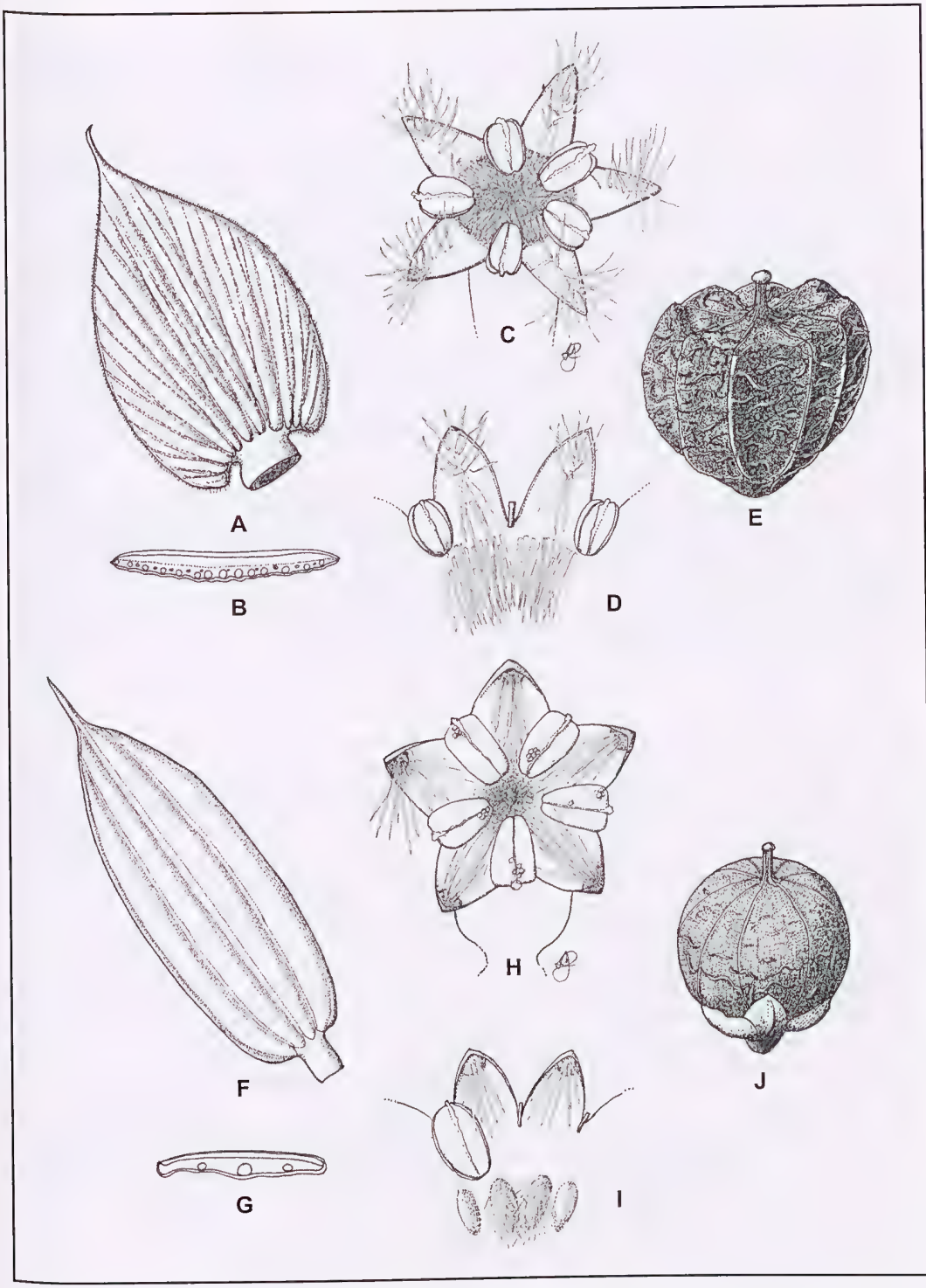

Figure 1. A–E. *Acrotriche patula*. A – leaf, abaxial surface, B – leaf, transverse section, C – corolla , D – upper portion of internal corolla tube, E – fruit; F–J. *Acrotriche lancifolia*. F – leaf, abaxial surface, G leaf, transverse section, H – corolla, I – upper portion of internal corolla tube, J – fruit. Drawn by Lorraine Cobb from *R. Davis* 10672 (A–D), *A.C. Beauglehole* 49453 (E), *M. Hislop* 3476 (F–I), *S.D. Hopper* 6872 (J).

from bare nodes below the leaves, mostly widely spreading, very occasionally pendulous; the axis 3–6(8) mm long, with 4–9(11) flowers, terminating in a bud-like rudiment or a blunt point, the base ± obscured by imbricate sterile bracts; indumentum of dense, curved and variably orientated hairs to 0.3 mm long. *Flowers* green or yellowish green but with the tube often suffused purple basally, erect or spreading and sessile. *Fertile bracts* shallowly triangular to depressed ovate, 0.9–1.1 mm long, 1–1.2 mm wide, glabrous or with a sparse short indumentum on abaxial surface, obtuse; venation inconspicuous. *Bracteoles* ovate, 1.1–1.5 mm long, 0.8–1.2 mm wide, keeled; glabrous apart from a few short hairs along the upper keel; minutely ciliolate along the upper and lower margins. *Sepals* ovate, 1.4–1.6 mm long, 1.1–1.4 mm wide, obtuse, both surfaces glabrous; abaxial surface with inconspicuous to moderately conspicuous venation, mostly pale greenish cream but often purple in an apical marginal band and between the veins in the distal half; margins very shortly and irregularly ciliolate. *Corolla tube* cylindrical, much longer than sepals (by up to 2.7 mm), 2.5–3.9 mm long, 1.1–1.5 mm wide, the outer surface glabrous, the inner with 5 hair tufts issuing from raised cushion like outgrowths (these hairs 0.3–0.5 mm long) in the throat, and a few hairs extending to the filament base, glabrous below the tufts; *lobes* widely spreading, 1–1.3 mm long, 0.7–0.9 mm wide at base, glabrous externally, the inner surface with prominent, subapical hair tufts (these hairs 0.4–0.7 mm long) and usually 1 or 2 scattered hairs below these tufts, the rest of the surface papillose; corolla lobes much shorter than the tube (ratio = 0.25–0.46:1). *Anthers* fully exserted at anthesis and usually held at right angles to the floral axis, 0.5–0.8 mm long; *filaments* terete, attached just below the anther apex, 0.3–0.5 mm long, adnate to tube just below the sinus. *Ovary* broadly ellipsoid or globose, 0.7–1 mm long, 0.7–0.9 mm wide, glabrous, 5–6(7) locular; *style* 0.7–1.1 mm long, tapering smoothly from ovary apex, included within corolla tube; *stigma* not expanded; *nectary* annular 0.4–0.6 mm long, entire or with slightly jagged rim, glabrous. *Fruit* globose, depressed-globose or depressed-obovoid, 2.6–3.1 mm long, 2.8–3.2 mm wide, much longer than calyx; mesocarp thin, manifesting as a shallow reticulum of transverse and longitudinal ridges on dried specimens; endocarp smooth; style persistent. (Figure 1 F–J)

Other specimens examined. WESTERN AUSTRALIA: Bremer Range, 8.7 km SE of Mount Gordon, 6.1 km ENE of Bremer Range track along track to Lake Medcalf, *c.* 20 km NE of Ninety Mile Tank, 21 Sep. 2002, *B. Archer* 2204 (CANB, MEL, PERTH); Hatter Hill Rd, 9.5 km S of intersection of Broombrush Rd and Digger Rocks – Hatter Hill Rds, *c.* 50-100 m NW of trig, 17 Oct. 1997, *E.A. Brown* 97/315, *P.G. Wilson & N. Lam* (NSW, NY, PERTH, UNSW); Dragon Rocks Nature Reserve no. 36128, north western section, 27 Aug. 1991, *A.M. Coates* 2618 (PERTH); Bremer Range, *c.* 0.9 km N of Hill 436, on E side of road, 20 m in, on sheet laterite, 15 Sep. 1994, *N. Gibson & M. Lyons* 1782 (PERTH); Frog Rock Nature Reserve, SW of Southern Cross, low breakaway N of main granite exposure, 1 Aug. 2003, *M. Hislop & F. Hort* MH 2970 (CANB, NSW, PERTH); UCL on N side of Brennan Rd, 6.8 km W of Panizza Rd, SW of Marvel Loch, 24 July 2005, *M. Hislop* 3476 (CANB, PERTH); 5.6 km NE of Hatters Hill on Lake Hope track, *c.* 45 km NE of Lake King, 28 Sep. 1988, *S.D. Hopper* 6872 (PERTH); S side of reserve track, 1.8 km E of Greay Rd (at base of breakaway), track leaves road 2.8 km S of Bendering Reserve Rd, North Karlgarin Nature Reserve, *c.* 24 km NE of Kondinin, 24 Sep. 1997, *G.J. Keighery & N. Gibson* 5765 (PERTH); 50 m SSE of Cockatoo Tank, 13.1 km S of Marvel Loch, 19 Oct. 1990, *F.H. & M.P. Mollemans* 3728 (PERTH); 3.75 km S of Duck Rock West Rd, 4 km SSW of the junction of Duck Rock West and Carlson Rds and 35 km ESE of Hyden, 13 Sep. 1991, *F.H. & M.P. Mollemans* 4264 (PERTH); 1 mile S of Hatter Hill, 4 Sep.1970, *K.R.Newbey* 3300 (CANB, NSW, PERTH); 10 km SW of Lake Cronin, *c.* 75 km E of Hyden, 3 Oct. 1979, *K.R. Newbey* 6178 (PERTH); 16 km SSE of Marvel Loch, 23 July 1981, *K.R. Newbey* 8334 (PERTH); NW margin of Lake Ace, 2 May 1985, *K. Newbey* 10926 (PERTH).

Distribution and habitat. Acrotriche lancifolia is distributed from the eastern wheatbelt in the Kondinin area, eastwards at least as far as the Bremer Range, well beyond the agricultural districts, and from

close to the Great Eastern Highway in the north to the Lake King area. It generally occurs on and around decomposing granitic or lateritic breakaways in shallow, rocky, loam or sandy loam soils and in open mallee woodland or shrubland communities where it may be locally dominant. (Figure 2)

Phenology. The main flowering period is between July and September, probably commencing earlier if soil moisture levels are unseasonably favourable. Mature fruit has been collected as early as September.

Etymology. The species epithet derives from the Latin *lancea* – a light spear or lance, and refers to the leaf shape. It is also intended to highlight a foliar difference between the new species and *A. patula*, in that the latter generally has broader, more obviously ovate rather than lanceolate leaves.

Conservation status. Although *A. lancifolia* is apparently rather specific as to habitat requirements, it has quite a wide distribution which extends into largely uncleared country to the east of the agricultural regions of the state. Populations are also conserved in several nature reserves across the eastern wheatbelt. It is therefore not recommended for inclusion on the Department Environment and Conservation's Priority Flora List.

Notes. Although quite widely distributed and locally common, the first collection of the new species was made as recently as 1970 (*K. Newbey* 3300). That specimen was treated by Jackes & Powell (1980) as a new record of *Acrotriche patula* from Western Australia. They did recognise however that the specimen was not typical of *A. patula*, describing it as a 'variant' of that species which had 'larger' and 'darker green' flowers. Although there is a tendency for larger flowers in *A. lancifolia*, these floral characters do not provide a useful basis for distinguishing the two species. It is somewhat surprising

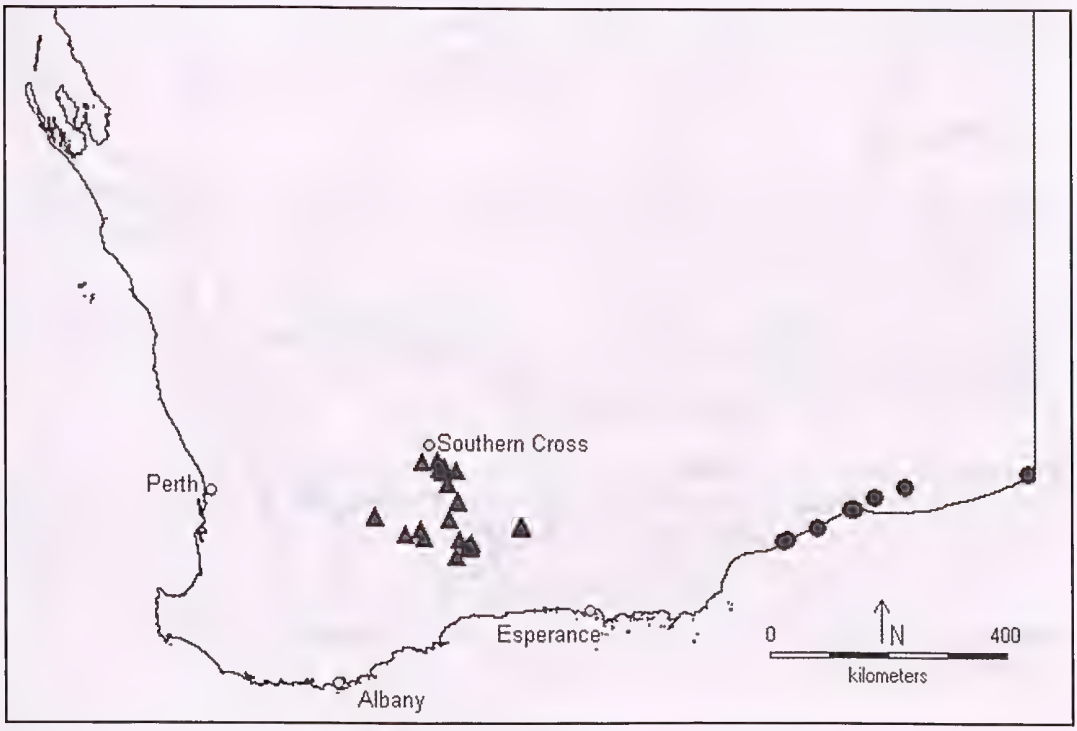

Figure 2. Distribution of *Acrotriche patula* ● and *A. lancifolia* ▲.

though that the authors did not seize upon two of the primary differences between the species – those of leaf anatomy and the presence/absence of cushion like outgrowths in the corolla throat. There is no doubt that the authors were aware of the significance of these characters as they were both employed elsewhere in their paper.

Coincidentally, Jackes & Powell were apparently unaware that by 1980 at least 4 collections of *A. patula sens. str.* had been made along the SE coast of Western Australia, the first of these by J.H. Willis in 1963.

Affinities. As noted above the new species is similar to and has for many years been confused with *A. patula*. Apart from the characters used in the key (and rather unusually in the tribe *Styphelieae* generally), a reliable difference in the branchlet indumentum also serves to separate the two. Whereas *A. lancifolia* has young branchlets either glabrous or with very short, sparse patent hairs and soon glabrescent, *A. patula* consistently has a longer, denser, more persistent indumentum of usually ± retrorse hairs.

There is a further, interesting distinction regarding the general aspect of the two species in the field. Many collectors note the bluish-green appearance of *A. lancifolia* which on close examination is seen to be caused by a pruinose coating on the leaves. This is usually still quite observable on dried specimens, although occasionally appearing wholly absent. There are no such field observations of pruinosity in the case of *A. patula* and neither was any trace of it seen on the specimens examined during this study.

The two species are geographically disjunct within Western Australia, with *A. lancifolia* having an inland distribution in the central south west of the state and *A. patula* occurring in the coastal south-east.

Acrotriche parviflora (Stschegl.) Hislop, *comb. nov.*

Decaspora parviflora Stschegl., *Bull.Soc.Imp.Naturalistes Moscou* 32 (1):10 (1859). *Trochocarpa parviflora* (Stschegl.) Benth., *Fl.Austral.* 4:167 (1868). *Type*: 'Nova Hollandia. *Drummond* coll. 4, no. 157' (*iso*: PERTH 00998699).

Acrotriche plurilocularis Jackes, *Telopea* 1:422-425 (1980). *Type*: 'Western Australia: Pallinup River, 4 km from the coast, rocky loam, 18-36 ins, *K.R. Newbey* 2998, 23 Nov. 1969' (*holo*: PERTH 01136224; *iso*: AD, BRI, CANB, CHR, K, L, MEL, NSW).

Notes. This species was first described under *Decaspora* R.Br. by Stschegleew (1859) but was later transferred to *Trochocarpa* R.Br. by Bentham (1869). Brown (1810) distinguished between these two genera, which he acknowledged were closely related, mainly by a difference in corolla shape and habit - *Trochocarpa laurina* (the genus was then monotypic) being a tree, and members of *Decaspora* low shrubs. Most later authors however, took the view that the two were congeneric and this was formalized by Bentham (1869) when he sank those species remaining in *Decaspora* into an expanded *Trochocarpa*.

Although there may still be a case for the recognition of two genera, it is clear that *Trochocarpa parviflora* is not closely related to either of these. The green flower colour, pattern of the corolla hair

distribution and strictly axillary inflorescence are all typical of the genus *Acrotriche*. On the other hand no species of *Trochocarpa* have an Acrotriche-like corolla hair distribution and all members of that genus have a terminal or terminal and upper axillary inflorescence.

The type of *Decaspora parviflora* has mature fruits present but only very immature flower buds and this must surely be the reason that both Stschegleew and Bentham, neither of whom apparently saw any other material, were misled as to the species' true affinities. Two fundamental morphological attributes of *Trochocarpa* are the numerous ovary locules (usually *c.* 10), and a drupe that spontaneously dissociates into loose pyrenes within the mesocarp at maturity. *A. parviflora* with 7-10 locules is similar to *Trochocarpa* in this respect, but several other species of *Acrotriche* also often have >5 locules and *A. aggregata*, as Bentham himself recognised, may also have as many as 10. In relation to their fruiting characteristics however, any similarities between *T. parviflora* and the members of *Trochocarpa sens. str.* are superficial only. Although the deeply ribbed fruiting endocarp of *T. parviflora* will break up under moderate pressure there is no doubt that, in the normal course of events, it is intact at the time of dispersal. The pericarp and mesocarp in this species are also very insignificant and do not appear to play an obvious role in the fruit's dispersal. This is not the case with the fruit of *Trochocarpa sens. str.* where the free pyrenes are held within a pulpy mesocarp, which is enclosed inside a persistent, usually colourful pericarp - the whole mature drupe being apparently well adapted to dispersal by fructivorous vertebrates.

The species was described a second time, as *Acrotriche plurilocularis*, by Jackes in Jackes & Powell (1980). However this was apparently done without consideration of the true identity of the disjunct *Trochocarpa parviflora*.

A curious feature of Jackes' description is that no mention is made of the distinctive, crescent shaped, corolla lobe hair tuft. The accompanying illustration, in fact shows a ± transverse tuft which is the common configuration for the genus. This character is the easiest means by which to separate flowering specimens of the species from *A. cordata* which is often very similar in its vegetative morphology.

Other specimens examined. WESTERN AUSTRALIA: Quaalup, Gairdner River, 16 Oct. 1928, *C.A. Gardner* 2230 (PERTH); Stirling Range National Park, Mt James track close to creek crossing *c.* 2 km W of Bluff Knoll access road, 31 Aug. 2005, *M. Hislop* 3490 (CANB, NSW, PERTH); 3 km N of Cheyne Beach, near rubbish tip, 27 Feb. 1983, *G.J. Keighery* 5952 (PERTH); 1 km west of Kamballup on Woogenilup Rd, 15 Sep. 1985, *G. J. Keighery & J.J. Alford* 413 (PERTH); Base of breakaway on gridline in SE of North Tarin Rock Nature Reserve, 24 Sep. 1997, *G.J. Keighery & N. Gibson* 7099 (PERTH); 25 km W of Bremer Bay, 14 Sep. 1969, *K. Newbey* 2878 (AD, BRI, CANB, CBG, CHR, K, L, MEL, NSW, PERTH, RSA); 2 km south of Kundip, 11 Oct. 1969, *K.R. Newbey* 2923 (AD, CANB, NSW, PERTH); Millars Point Rd, slope above Beaufort Inlet, 17 Nov. 1992, *C.J. Robinson* 1016 (PERTH); 2.4 km W of Chillinup Pool on Chillinup Rd, 21 Oct. 1992, *C.J. Robinson* 1180 (PERTH); Bushland remnant NE corner of Plantagenet Location 3259, E of Chester Pass Rd, *c.* 2.5 km NNE of Kamballup, 5 Nov. 2002, *E.M. Sandiford* EMS 650 (ALB, PERTH); E of Holmes Rd, Lake Chillinup Nature Reserve, South Stirlings, 14 Nov. 2002, *E.M. Sandiford* EMS 680 (ALB, PERTH).

Distribution. Acrotriche parviflora is distributed across subcoastal or occasionally more inland districts between the Stirling Ranges in the west to around Kundip, north of Hopetoun in the east, with a disjunct population near Tarin Rock west of Lake Grace.

Conservation status. As *Trochocarpa parviflora* the species has been treated as a Priority Three taxon (Conservation Codes for Western Australian Flora). However, its conservation status is now determined as Priority Four in the light of the combined distribution of specimens previously housed at PERTH under *Acrotriche plurilocularis*. At least 4 populations are conserved in nature reserves or National Parks.

Acrotriche depressa R.Br., *Prod. Fl. Nov. Holl.* 548(1810).– *Styphelia depressa* (R.Br.) Spreng., *Syst. Veg.* 1(1824). Type citation: "(M.) v.v. absque flor. fruc. vix matur." *Type:* Kangaroo Island [South Australia], 5 April 1802, *R. Brown s.n.* (*holo:* BM).

Notes. Since the nineteenth century this species has been considered native to Western Australia as well as South Australia. Bentham (1869), Ewart (1930), Black (1952) and Paterson (1960) included Western Australia in their distribution statements for the species (although Paterson noted that she had personally not seen material from that state). It was also treated by Blackall and Grieve (1981).

It appears that all were influenced by a single collection made by William Baxter in the 1820's with the notation 'Sand ridges, Bald Head' - this presumably being the Bald Head at the tip of the Flinders Peninsula SE of Albany. Although the Albany area is now well known botanically, no subsequent collections of *A. depressa* have been made from here or anywhere else in Western Australia in the intervening 180 years. Baxter collected extensively near Albany and elsewhere in south coastal districts of Western Australia but is also known to have collected at Kangaroo Island off the coast of South Australia (Kraehenbuehl 1986).

A close examination of the Baxter collection suggests that the knowledge of his subsequent visit to Kangaroo Island may in fact be relevant information. Although the fragment at PERTH is very small, the detail of its foliar morphology exactly matches that of the Kangaroo Island variant of the species, which as noted by Powell *et al.* (1986), is characterised by 'smaller, shorter, almost cordate based leaves'. Given the fact of this distinctive foliar morphology and the complete absence of subsequent Western Australian collections, it now seems reasonable to believe that the Baxter specimen was really collected at Kangaroo Island and that the annotation 'Bald Head' is erroneous. The other possibility, that a very disjunct western population of the species, indistinguishable from the Kangaroo Island variant, was extant in the early nineteenth century but now extinct, seems very much less likely.

Specimens examined. SOUTH AUSTRALIA: Strathalbyn, 26 Aug. 1958, *B.R. Paterson s.n.* (AD, NSW, PERTH); American River, Kangaroo Island, 18 Aug. 1958, *B.R. Paterson s.n.*(AD, BRI, MEL, NSW, PERTH); Sand ridges, Bald Head (now believed to have been collected on Kangaroo Island), *W. Baxter s.n.* (PERTH).

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References

Bentham, G. (1869). 'Flora Australiensis' Vol. 4. (Reeve: London).

Brown, R. (1810). 'Prodromus Florae Novae Hollandiae.' Vol. 1. (Johnson: London).

Candolle, A.P. de (ed.) (1839). 'Prodromus Systematis Naturalis Regni Vegetebilis' Vol 7(2). (Treuttel et Wurtz: Paris).

Jackes, B.R. and Powell, J.M. (1980.) Additions to the genus *Acrotriche* R.Br. (Epacridaceae). *Telopea* 1(6): 421–428.

Jobson, P.C. and Whiffin, T. (1990). A new species of *Acrotriche* R.Br. (Epacridaceae) from south-eastern Australia. *Muelleria* 7(2): 295–299.

Kraehenhuehl, D.N. (1986). History of Botany in South Australia (1800-1955). *In:* 'Flora of South Austalia'. Part 1 (Ed J.P. Jessop and H.R. Toelken). (South Australian Government Printing Division: Adelaide).

Mueller, F.J.H. von (1855). Description of fifty new Australian plants, chiefly from the colony of Victoria. *Transactions and Proceedings of the Victorian Institute for the Advancement of Science* 1:40.

Paterson, B.R. (1961). Revision of the genus *Acrotriche* R.Br. (Epacridaceae). *Proceedings of the Linnean Society of New South Wales Series 2* 85: 75–93.

Powell, J.M., Highet, J., Chapman A. (1986). Epacridaceae. *In:* 'Flora of South Australia'. Part 2 (Ed. J.P. Jessop and H.R. Toelken). (South Australian Government Printing Division: Adelaide).

Quinn, C.J., Crayn, D.M., Heslewood, M.M., Brown, E.A., Gadek, P.A. (2003). A molecular estimate of the phylogeny of Styphelieae (Ericaceae). *Australian Systematic Botany* 16: 581–594.

Quinn, C.J., Brown, E.A., Heslewood, M.M., Crayn, D.M. (2005). Generic concepts in Styphelieae (Ericaceae): the *Cyathodes* group. *Australian Systematic Botany* 18: 439–454.

Stschegleew, S.S. (1859). Descriptio Epacridearum Novarum. *Bulletin de la Societe Imperiale des Naturalistes de Moscou* 32(1): 10.

Weiller, C.M. (1996). Reassessment of *Cyathodes* (Epacridaceae). *Australian Systematic Botany* 9: 491–507.

Weiller, C.M. (1999). *Leptecophylla*, a new genus for species formerly included in *Cyathodes* (Epacridaceae). *Muelleria* 12: 195–214.